



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/543,628	04/05/2000	Nancy E. Iwamoto	30-5010(4962)	6586
7590 01/05/2004			EXAMINER	
Sandra P. Thompson Riordan & McKinzie Plaza Tower 600 Anton Blvd., 18th Floor Costa Mesa, CA 92626-1924			FEELY, MICHAEL J	
			ART UNIT	PAPER NUMBER
			1712	

DATE MAILED: 01/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/543,628

Applicant(s)

IWAMOTO, NANCY E.

Examiner

Michael J Feely

Art Unit

1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-21 and 40-55 is/are pending in the application.
- 4a) Of the above claim(s) 10-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 40-55 is/are rejected.
- 7) ☒ Claim(s) 43,44,47,48,52 and 53 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 April 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Previous Claim Objections

1. The objection to claims 22-39 has been rendered moot by the cancellation of claims 22-39.

Previous Claim Rejections - 35 USC § 112

2. The rejections of claims 22-39 under 35 USC § 112 1st and 2nd paragraphs have been rendered moot by the cancellation of claims 22-39.

Previous Specification Objection

3. The objection to the Specification stands for the reasons set forth in set forth in § 9 of the previous Office action (Non-final action mailed 02/26/2003). Applicant failed to address this issue in the response filed July 31, 2003.
4. The objection to the Specification relating to the introduction of new matter, as set forth in § 10 of the previous Office action, has been rendered moot by the cancellation of claims 22-39.

Claim Objections: Numbering

5. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

New claims were introduced in the response filed July 31, 2003: 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, **52, 52, 53, and 54**. Misnumbered claims 52, 52, 53, and 54 have been renumbered 52, 53, 54, and 55.

Pending Claims

6. Claims 40-55 are pending. Claims 10-21 have been withdrawn from consideration.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 40-55 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. Claim 40 recites the limitation "the substrate and the polymer couple" in the electronic component as claimed. There is insufficient antecedent basis for this limitation in the claim.

Claim 49 recites the limitation "the first polymer and the second polymer couple" in the electronic component as claimed. There is insufficient antecedent basis for this limitation in the claim.

In the independent claims, an interface is described as an interface formed from "the substrate and the polymer couple" and "the first polymer and the second polymer couple"; however, neither claim describes a relationship (coupling) of these materials with respect to one another prior to introducing this limitation.

Based upon the specification, it appears that the substrate and the polymer layers are coupled with each other; hence, this coupling results in an interface between the materials. The following are suggested changes for these claims:

40. An electronic component comprising: a substrate and a polymer, wherein the polymer and the substrate are coupled to one another to form an interface; and wherein the substrate and the polymer are selected as candidates based on a computer-assisted model.

49. An electronic component comprising: a substrate, a first polymer, and a second polymer, wherein the first polymer and the second polymer are coupled to one another to form an interface; and wherein the first polymer and the second polymer are selected as candidates based on a computer-assisted model.

10. Claims 41-48 are rejected because they depend from claim 40, and claims 50-55 are rejected because they depend from claim 49.

11. Claims 43 and 52 recite the following limitation: “wherein the polymer comprises a rubber-modified melamine/novolac/bis A formulation.” It is unclear if this formulation is chemically modified by rubber or modified by the physical presence of rubber. Based on Example 2 and Figure 10 (see page 20 of the specification), a polymer was derived from a formulation of “a melamine/novolac/bis A epoxy mixture”. This mixture was “modified” by the additional presence of rubber (butadiene). Therefore, it appears that the formulation is modified by the physical presence of rubber in the formulation.

The claim language does not say that this formulation is an epoxy mixture; however, the specification uses the phrase, “melamine/novolac/bis A formulation,” interchangeably with the

phrase, “melamine/novolac/bis A epoxy mixture”. For this reason, the limitation is being interpreted as “melamine/novolac/bis A epoxy mixture”.

However, where the formulation is described as an “epoxy mixture”, it is unclear which of the melamine, novolac, and bis-A is epoxy functional. Melamine is used as a curative, while novolac resins and bisphenol-A resins are commonly used as the backbone of epoxy resins; however, novolac resins are also used as curatives.

For the purposes of examination, the claim language interpreted to mean: --wherein the polymer is derived from a formulation comprising a rubber, melamine, novolac resin, and bisphenol-A epoxy resin--.

Specification

12. The disclosure is objected to because of the following informalities: although the specification demonstrates a reduction to practice, the specification fails to provide clarity regarding the claimed invention set forth in claims 43 and 52. Example 2 and Figure 10 (see page 20 of the specification) disclose a polymer derived from a formulation of “a melamine/novolac/bis A epoxy mixture”. However, where the formulation is described as an “epoxy mixture”, it is unclear which of the melamine, novolac, and bis-A is epoxy functional.

Appropriate correction is required.

Claim Objections

13. Claims 43 and 52 are objected to because of the following informalities: the claim language describes a polymer that “comprises” a formulation. Although a polymer can be derived from a formulation, it is unclear how the polymer can comprise a formulation.

A suggested change would be: --wherein the polymer is derived from a formulation comprising--.

Appropriate correction is required.

14. Claims 44 and 53 are objected to because of the following informalities: the claim language describes a polymer that “comprises” a chemical precursor. Although a polymer can be derived from a chemical precursor, it is unclear how the polymer can comprise a chemical precursor.

A suggested change would be: --wherein the polymer is derived from a chemical precursor selected from the group consisting of--.

Appropriate correction is required.

15. Claims 47 and 48 objected to because of the following informalities: the claim language describes an interface that is “selected” from a plurality of candidate interfaces, wherein each candidate interface comprises data. Although an interface can be formed as a result of selecting candidate substrates and polymers, it is unclear how the interface itself is “selected”. Furthermore, data is associated with the resulting interface. The interface does not “comprise” data.

A suggested change would be: --wherein the polymer and substrate are selected from a plurality of candidate polymers and substrates--, and --wherein the resulting interface is associated with at least one data set selected from the group consisting of: a set of modeling data, a set of durability data, and a set of evaluation data--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102/103

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 40-55 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Saida et al. (US Pat. No. 5,718,039).

Regarding claims 40-48, Saida et al. disclose **(40)** and electronic component (Abstract) comprising: a substrate (Abstract; column 2, lines 25-30; column 4, line 65 through column 5, line 4: *prepreg*) and a polymer (Abstract; column 2, lines 25-36: *insulating layer*), wherein the polymer and the substrate are coupled to one another to form an interface (Abstract; column 2, lines 25-36; column 4, lines 37-56; Figure 1); **(43)** wherein the polymer is derived from a formulation comprising a rubber (column 2, lines 25-36; column 3, lines 8-29), melamine (column 2, lines 25-36), novolac resin (column 2, lines 54-65), and bisphenol-A epoxy resin (column 2, lines 25-36 and 41-53); **(44)** wherein the polymer is derived from a chemical precursor selected from the group consisting of: tris(2,3-epoxypropyl)isocyanurate; 1,3,5-tris(2-hydroxyethyl) 1,3,5-triazine 2,4,6-(1H, 3H, 5H) trione; bis(2,3-epoxycyclopentyl ether); 4,4'-oxydianiline; bisphenol A glycidyl ether; and bis(3,4-epoxycyclohexylmethyl)adipate

(column 2, lines 41-53); **(45)** wherein the polymer is amorphous, crosslinked, crystalline or branched (column 2, lines 54-65; column 4, lines 42-56); and **(46)** wherein the polymer is crosslinked (column 2, lines 54-65; column 4, lines 42-56).

Regarding claims 49-55, Saida et al. disclose **(49)** and electronic component (Abstract) comprising: a substrate (Abstract; column 4, lines 37-41: *copper foil*), a first polymer (Abstract; column 2, lines 25-30; column 4, line 65 through column 5, line 4: *prepreg*) and a second polymer (Abstract; column 2, lines 25-36: *insulating layer*), wherein the first polymer and the second polymer are coupled to one another to form an interface (Abstract; column 2, lines 25-36; column 4, lines 37-56; Figure 1); **(52)** wherein at least one of the first polymer or the second polymer is derived from a formulation comprising a rubber (column 2, lines 25-36; column 3, lines 8-29), melamine (column 2, lines 25-36), novolac resin (column 2, lines 54-65), and bisphenol-A epoxy resin (column 2, lines 25-36 and 41-53); **(53)** wherein at least one of the first polymer or the second polymer is derived from a chemical precursor selected from the group consisting of: tris(2,3-epoxypropyl)isocyanurate; 1,3,5-tris(2-hydroxyethyl) 1,3,5-triazine 2,4,6-(1H, 3H, 5H) trione; bis(2,3-epoxycyclopentyl ether); 4,4'-oxydianiline; bisphenol A glycidyl ether; and bis(3,4-epoxycyclohexylmethyl)adipate (column 2, lines 41-53); **(54)** wherein at least one of the first polymer or the second polymer is amorphous, crosslinked, crystalline or branched (column 2, lines 54-65; column 4, lines 42-56); and **(55)** wherein at least one of the first polymer or the second polymer is crosslinked (column 2, lines 54-65; column 4, lines 42-56).

Regarding both sets of claims, Saida et al. do not disclose that: **(40)** the substrate and the polymer are selected as candidates based on a computer-assisted model, **(41)** the computer-assisted model comprises strain cycling data, **(42)** the computer-assisted model evaluates at least

Art Unit: 1712

one property of the interface, including size, shape, and bond geometry, (47) the polymer and substrate are selected from a plurality of candidate polymers and substrates, and (48) the resulting interface is associated with at least one data set selected from the group consisting of: a set of modeling data, a set of durability data, and a set of evaluation data; OR (49) the first polymer and the second polymer are selected as candidates based on a computer-assisted model, (50) the computer-assisted model comprises strain cycling data, and (51) the computer-assisted model evaluates at least one property of the interface, including size, shape, and bond geometry. However, these claim limitations are product-by-process limitations.

It has been found that even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process” – *In re Thorpe*, 777 F. 2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). The electronic component of Saida et al. meets all of the physical and material limitations of the instant invention. Therefore, it would have anticipated or would have been an obvious variation of the instant invention.

Conclusion

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

Art Unit: 1712

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Feely whose telephone number is 703-305-0268. The examiner can normally be reached on M-F 8:30 to 5:00. Effective December 18, 2003, the examiner can be reached at 571-272-1086.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Michael J. Feely
Patent Examiner
Art Unit 1712


PHILIP TUCKER
PRIMARY EXAMINER
ART UNIT 1712

December 9, 2003